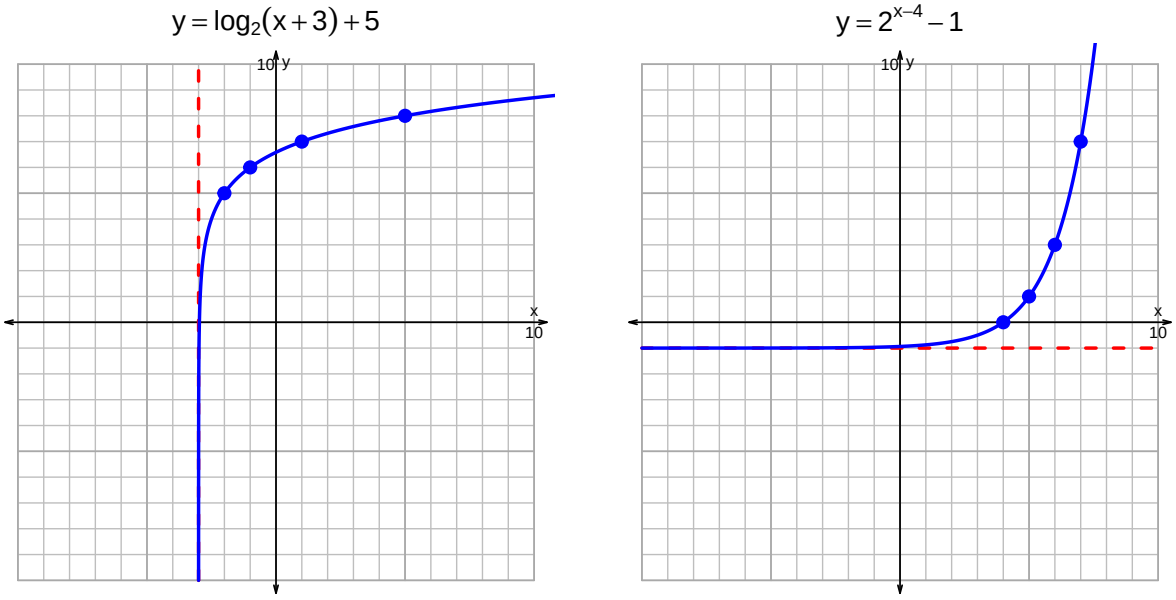
Name: Date:

s18: EXP LOG (SLTN v316)

1. (10 pts) Graph $y = \log_2(x+3)+5$ and $y = 2^{x-4}-1$ on the grids below. Also, draw any asymptotes with dashed lines.



Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-11 = \left(\frac{-7}{4}\right) \cdot 2^{3t/5}$$

Divide both sides by $\frac{-7}{4}$.

$$\frac{11 \cdot 4}{7} = 2^{3t/5}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{11 \cdot 4}{7}\right) = \frac{3t}{5}$$

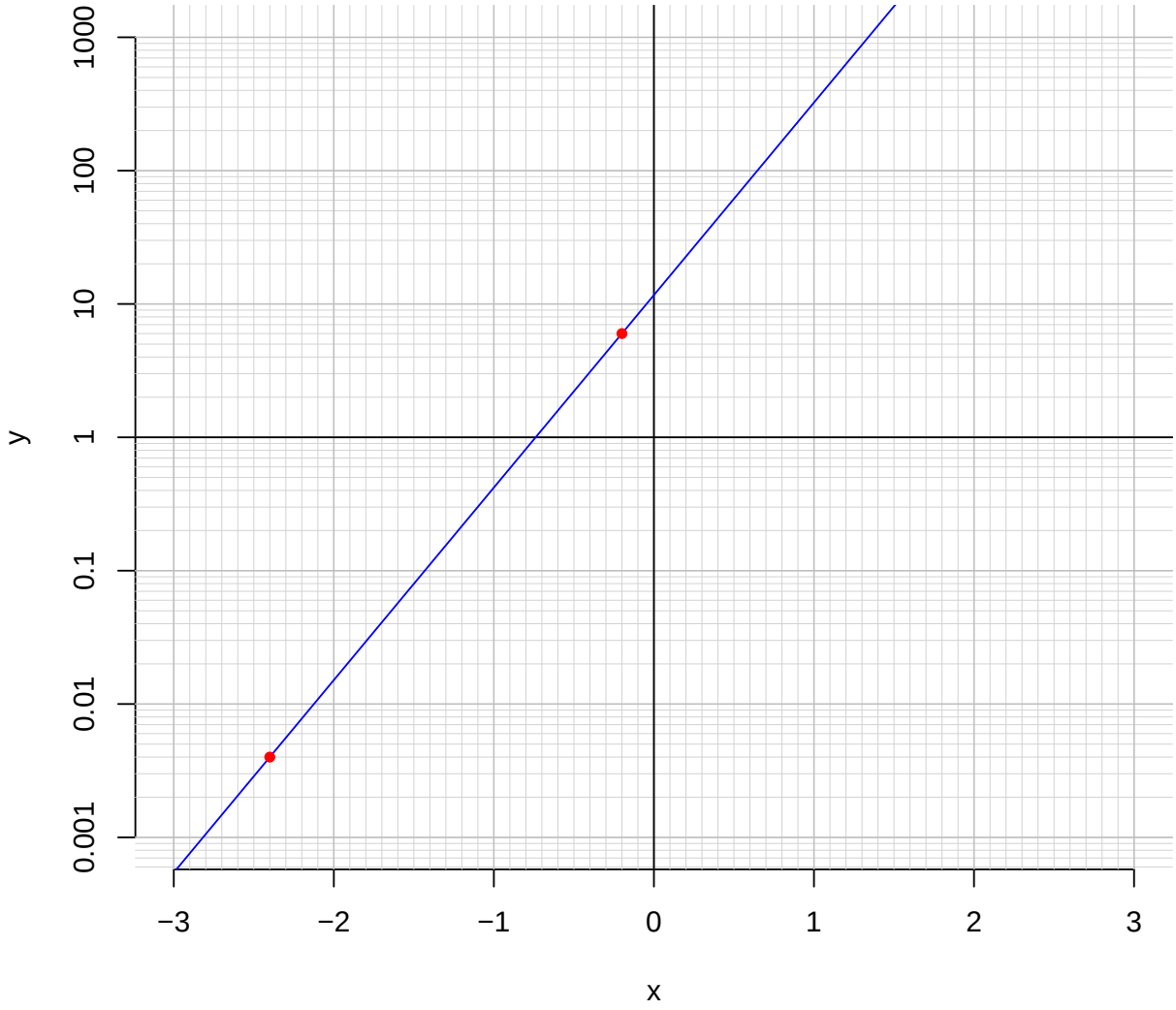
Divide both sides by $\frac{3}{5}$.

$$\frac{5}{3} \cdot \log_2\left(\frac{11 \cdot 4}{7}\right) = t$$

Switch sides.

$$t = \frac{5}{3} \cdot \log_2\left(\frac{11 \cdot 4}{7}\right)$$

3. (10 pts) An exponential function $f(x) = 11.7 \cdot e^{3.32x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-2.4)$.

$$f(-2.4) = 0.004$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{1}{3.32} \cdot \ln\left(\frac{x}{11.7}\right)$$

Using the plot above, evaluate $f^{-1}(6)$.

$$f^{-1}(6) = -0.2$$